Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Ligado Networks LLC Request to Initiate a	)	
Rulemaking to Allocate the 1675-1680 MHz	)	RM-11681
Band for Terrestrial Mobile Use Shared with	)	
Federal Use	)	

REPLY COMMENTS OF SNR WIRELESS

I. INTRODUCTION

SNR Wireless ("SNR") respectfully submits these reply comments in response to the Public Notice issued by the Federal Communications Commission ("FCC" or "Commission") in the above-captioned proceeding.[1] If the Commission adopts the Ligado Networks LLC ("Ligado") proposal to allocate the 1675-1680 MHz band for terrestrial mobile use (the "Ligado Proposal"), the Commission should also take action to protect the critical federal uses in the band and the legitimate investment-backed expectations of AWS-3 licensees. The record in this proceeding demonstrates that the Ligado Proposal could impact critically important federal safety uses in the band. Moreover, if adopted, the Ligado Proposal would result in significant unanticipated costs for AWS-3 licensees. If the FCC adopts the Ligado Proposal, the 1675-1680 MHz licensees should bear all costs that result for AWS-3 and other affected licensees. Additionally, for the protection of all affected spectrum users, the FCC should subject future 1675-1680 MHz licensees to the same coordination and monitoring requirements imposed on AWS-3 licensees, including the obligation to engage with federal users to increase the available

[1] *Comment Sought to Update the Record on Ligado's Request that the Commission Initiate a Rulemaking to Allocate the 1675-1680 MHz Band for Terrestrial Mobile Use Shared With Federal Use*, Public Notice, 31 FCC Rcd 3813 (2016) ("*Ligado Public Notice*").

interference budget, coordinate with federal users through the CSMAC process, and engage in ongoing radio frequency ("RF") monitoring.

II. DISCUSSION

A. The Record in this Proceeding Demonstrates the Importance of Protecting Critical Data Transmissions by the Federal Government.

The many comments urging the Commission to protect federal uses from interference from commercial use in the 1675-1680 MHz band underscore the importance of existing federal use of this spectrum for research, weather tracking, and natural disaster response. If the FCC adopts the Ligado Proposal, new terrestrial mobile uses would share the spectrum.

The National Oceanic and Atmospheric Administration, Department of Defense, and Department of Interior (collectively, the "Federal Users") receive data from Geostationary Operational Environmental Satellites ("GOES") satellites using frequencies between 1673 and 1694.5 MHz. Non-federal users also receive this data. The Federal Users receive data from Polar-orbiting Operational Environmental Satellites ("POES") satellites using the 1695-1710 MHz band.[2] Additionally, the first satellite to support the next generation of GOES, "GOES-R," will be launched later this year.[3] GOES-R uses more advanced and higher data rate signaling channels than legacy GOES, and requires a higher bandwidth channel. The GOES-R frequencies are also directly adjacent to the 1675-1680 MHz band, and one of the GOES-R channels extends 300 kilohertz into that band, creating an overlap. The Federal Users' satellite transmissions include real-time weather data.

---

[2] *See Transition Plans and Transition Data for the 1695-1710 MHz Band*, NTIA (Oct. 29, 2015), available at https://www.ntia.doc.gov/other-publication/2015/transition-plans-and-transition-data-1695-1710-mhz-band.

[3] *Final Report: Working Group 1 – 1695-1710 MHz Meteorological-Satellite*, Commerce Spectrum Management Advisory Committee, at 5 (Jan. 22, 2013), *available at* https://www.ntia.doc.gov/files/ntia/publications/wg_1_report.pdf ("*CSMAC Report*").

Commenters on the Ligado Proposal – overwhelmingly weather, transit, and infrastructure entities – described the "critical" and "life-saving" nature of the data received from the Federal Users' satellites.[4] Commenters documented the importance of the real-time weather data transmitted by these satellites for uses ranging from day-to-day port operations and navigation for pilots,[5] to receipt of "crucial weather information" that allows for an immediate response to "dangerous weather like tornadoes, hurricanes and wildfires."[6] Emergency-management entities emphasized that any interference to the Federal Users' receivers could delay transmissions of weather and disaster information, and these delays would negatively impact their ability to warn and inform affected populations.[7] The International Association of Emergency Managers ("IAEM") explained that its members "depend on reliable, accurate and direct, timely data as a basis for emergency management decisions related to floods and flash floods, water management, severe thunderstorms, tornados, wildland fires and hurricanes. [Its] members depend on the data to provide real-time information so [IAEM] in turn can offer accurate and timely public warning and preparation instructions."[8] IAEM indicated that anything "less than live, real-time, uninterrupted information" is "unacceptable and threatens

[4] Comments of AccuWeather, RM-11681, at 2 (filed June 20, 2016); Comments of the Aerospace Industries Association, RM-11681, at 2 (filed June 21, 2016); *see also* Comments of the Canadian Shipowners Association, RM-11681 (filed June 17, 2016).

[5] *See* Comments of the American Association of Port Authorities, RM-11681 (filed June 2, 2016); Comments of the American Pilots Association, RM-11681 (filed May 31, 2016).

[6] Comments of the American Weather and Climate Industry Association, RM-11681, at 3 (filed June 17, 2016).

[7] *See* Comments of the Governor's Office of Emergency Services of the State of California, RM-11681 (filed June 21, 2016); Comments of Emergency Management Department Unified Government of Wyandotte County and Kansas City Kansas, RM-11681 (filed June 21, 2016); Letter from Michael D. Talbott, Executive Director, Harris County Flood Control District, to Marlene H. Dortch, Secretary, FCC, RM-11681 (filed June 21, 2016).

[8] Comments of the International Association of Emergency Managers, RM-11681, at 2 (filed June 20, 2016).

important public safety activities."[9] CTIA, one of just two commenters that filed in favor of the Ligado Proposal, acknowledges that an FCC rulemaking on reallocating the 1675-1680 MHz band would need to, as a threshold matter, determine *whether* the 1675-1680 MHz band can be shared and still protect existing uses in the band.[10] SNR agrees with these commenters that the Federal Users provide critically important services using this spectrum, and thus urges the Commission to take steps to protect their use.

B. The FCC and Federal Users Took Actions Prior to Auction 97 to Protect the Federal Users from Interference.

Recognizing the importance of the Federal Users' data transmissions, the FCC and Federal Users took action in 2014 prior to Auction 97 to protect this use from interference. Specifically, the Commerce Spectrum Management Advisory Committee ("CSMAC") Working Group 1 analyzed coexistence between the AWS-3 and federal operations, and developed protection criteria to ensure that commercial AWS-3 1695-1710 MHz licensees can coexist with Federal Users in the 1695-1710 MHz band and the adjacent 1675-1695 MHz band without "loss of capability" for the Federal Users.[11] CSMAC's analysis, however, did not consider the possibility of additional interference resulting from the commercial downlink operations in the 1675-1680 MHz band as outlined in the Ligado Proposal.

The CSMAC Working Group 1 process developed protection distances around each identified meteorological earth station within which commercial AWS-3 operators in the 1695-

---

[9] *Id.*

[10] Comments of CTIA, RM-11681, at 4 (filed June 21, 2016).

[11] *See CSMAC Report*, App. 1. The protection requirement and method of coordination were adopted prior to Auction 97 as section 27.1134(c) of the FCC's rules. 47 C.F.R. § 27.1134(c); *see also Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHZ, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, 29 FCC Rcd 4610 (2014).

1710 MHz band must coordinate with the Federal Users.[12] This coordination must be based on a recommended interference threshold, which CSMAC Working Group 1 calculated for each earth station based on the specific technical characteristics of each receiver.[13] This created a coordination zone around each earth station based on maximum aggregate interference within which commercial AWS-3 operations in the 1695-1710 MHz band must be coordinated. The CSMAC process, which had broad wireless industry participation, was critical for the protection of the Federal Users and the delineation of clear operational parameters for AWS-3 licenses.

C. Any 1675-1680 Licensees Must Take Steps to Protect the Federal Users and AWS-3 Licensees Use of the Spectrum.

To protect the interests of both AWS-3 licensees and the Federal Users in the event the FCC adopts the Ligado Proposal, all 1675-1680 MHz licensees should be required to engage in the same coordination that was required for AWS-3 licenses, and be subject to the same monitoring requirements as AWS-3 licensees. The 1675-1680 MHz licensees should also bear all costs associated with these processes.

1. Impact of Ligado Proposal on AWS-3 Licensees

In addition to the potential for interference to the Federal Users, if adopted, the Ligado Proposal will result in significant unanticipated costs for AWS-3 licensees. Ligado is proposing a new nationwide deployment of base stations transmitting on a 10 MHz LTE channel in the 1670-1680 MHz band.[14] This deployment would add to the interference already expected for the Federal Users' earth stations. While Ligado predecessor LightSquared commissioned reports

[12] Coordination is required within the protection zones for devices with a maximum Effective Isotropic Radiated Power ("EIRP") of 20 dBm or less. For devices with an EIRP of more than 20 dBm up the maximum 30 dBm, coordination is required nationwide. *See CSMAC Report*.

[13] *CSMAC Report,* App. 7. Table 4 on 7-9 and 7-10 shows the interference protection criteria for each earth station.

[14] *Ligado Public Notice* at 2.

from Alion to define protection zones for the Federal Users' earth stations within which Ligado would coordinate its base station deployments,[15] any Ligado base station deployment within or around these zones would consume a portion of the allowed interference budget.[16] This would reduce the interference budget available for AWS-3 licensees.

Any such reduction in the interference budget for AWS-3 licensees would limit the number of AWS-3 mobile devices that could operate within the coordination zones, degrading the AWS-3 service. Such degradation would upset the investment-backed expectations of Auction 97 bidders because, as contemplated by the CSMAC process, the entire interference budget was allocated exclusively to AWS-3 licensees prior to Auction 97.[17]

Sharing the interference budget with 1675-1680 MHz licensees, assuming a 50-50 split, would require AWS-3 licensees to deploy twice as many base stations in many areas, increasing dramatically the cost of deploying an AWS-3 network compared to the licensees' current expectations.[18] Ligado's proposed base station transmissions at 1675-1680 MHz would also

---

[15] *See Assessment of the Potential for LightSquared Broadband Base Stations in the 1670-1680 MHz Band To Interfere with Select NOAA Legacy Ground Locations*, Alion Science and Technology (February 2014), *available at* http://apps.fcc.gov/ecfs/document/view?id=7521098269.

[16] This assumes the protection zones determined by Alion are sufficient. However, Alion's protection zones were not developed through the collaborative government and industry CSMAC process, and therefore do not necessarily represent the area required to protect Federal Users from interference.

[17] Moreover, a portion of the proceeds from Auction 97 was allocated to fund certain costs for facilitating sharing of the 1695-1710 MHz band between AWS-3 and Federal Users, such as the cost of relocating radiosondes and adding RF monitoring equipment to Federal Users' earth stations. *See National Weather Service Radiosonde Program Breakdown of Costs*, NTIA (July 2014), *available at* https://www.ntia.doc.gov/files/ntia/publications/initial_estimated_costs_and_timelines_1695-1710_mhz_band_05-12-2014.pdf (showing $80 million allocated for relocating radiosondes and $443 million allocated for RF monitoring).

[18] A 50-50 split in the operational interference budget with 1675-1680 MHz licensees would result in a 3 dB reduction of allowed operational interference into federal earth stations from

cause interference to AWS-3 base station receivers at 1695-1710 MHz. This would create siting issues and impose other constraints for AWS-3 deployments. For example, co-location of Ligado and AWS-3 base stations would require some level of vertical separation to prevent interference, or, if necessary, the installation of external filters at the victim AWS-3 base stations. This, too, would add to the cost for AWS-3 operations, as well as decrease the performance of the network. A reduction in the interference budget would also limit the number of AWS-3 mobile devices that could operate in and around the coordination zones, which would degrade the utility and deployment of the AWS-3 spectrum. These impacts from allocation of the 1675-1680 MHz band for terrestrial mobile use would therefore alter significantly the radio-frequency environment for AWS-3 licensees just one year after the purchase of the licenses, and impose significant additional network deployment costs on AWS-3 licensees.

2. Coordination and Monitoring by 1675-1680 MHz Licensees

To protect all affected spectrum users, and ensure the accountability of 1675-1680 MHz licensees if the Commission adopts the Ligado Proposal, the Commission should require licensees in the 1675-1680 MHz band to complete the same coordination processes as the AWS-3 licensees and be subject to the same monitoring requirements.

Any new 1675-1680 MHz licensees should undertake a three-step process. First, the licensees should engage with the Federal Users to secure approval to increase the applicable interference budget. Second, the licensees should go through the CSMAC process to determine protection criteria and coordination zones, taking into account the allowable increase of interference budget determined in Step 1. In addition to protecting other users of the spectrum,

---

AWS−3 licensees. To meet the lower interference budget and support the same number of mobiles as without the 3 dB decrease, AWS−3 mobiles would need to transmit with an average of 3 dB less power. This reduction in power would result in a 29% decrease in site radius and a 50% decrease in each site's coverage area. Thus, twice as many base stations would be required to cover the same area.

the CSMAC process has the added benefit of allowing broad industry participation. Finally, the 1675-1680 MHz licensees must be subject to the same RF monitoring required for AWS-3 licensees.[19] Moreover, 1675-1680 MHz licensees should pay all costs associated with these processes, including the costs to expand the currently proposed RF monitoring system to include the monitoring of base station transmissions from the 1675-1680 MHz band and to distinguish 1675-1680 MHz transmissions from AWS-3 uplink transmissions so that the respective interference budgets can be monitored and enforced independently. This three-step process would ensure the same rigor in the allocation of the 1675-1680 MHz band as was applied to nearby bands, and protect the operations of all affected spectrum users.

III. CONCLUSION

As demonstrated above and in the record in this proceeding, the Ligado Proposal raises significant concerns for the Federal Users in the 1675-1680 MHz band, as well as for AWS-3 licensees. The Ligado Proposal would impose additional costs on AWS-3 licensees to address these issues, frustrating their legitimate, investment-backed expectations. Before the Commission moves forward on the Ligado Proposal, it should carefully examine these impacts. If the FCC approves the Ligado Proposal, SNR respectfully requests that the 1675-1680 MHz licensees absorb all costs incurred by AWS-3 licensees as a result. The Commission should additionally require 1675-1680 MHz licensees to complete the same coordination processes and be subject to the same monitoring as AWS-3 licensees.

[19] *Amendment to the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, 29 FCC Rcd 4610 ¶ 19 (2014) (stating that for AWS-3 licensees, "Federal incumbents plan to develop and deploy real-time spectrum monitoring systems for the 1695-1710 MHz band. We will also require that uplink/mobile devices be under the control of, or associated with, a base station as a means to facilitate shared use of the band and prevent interference to Federal operations.").

Respectfully submitted,

By */s/ Ari Q. Fitzgerald*

Ari Q. Fitzgerald
Tom Peters
Cara O. Schenkel
Hogan Lovells US LLP
555 13th Street, NW
Washington, DC 20004
Phone: (202) 637-5663

Counsel to SNR Wireless

August 11, 2016